Five-Year Review Report

Second Five-Year Review Report
for
The Mottolo Pig Farm Superfund Site
Town of Raymond
Rockingham County, New Hampshire

September 2003

Prepared by:
The United States Environmental Protection Agency
Region 1, New England
Boston, Massachusetts

EPA
New England

Approved by:

for Susan Studlien, Acting Director
Office of Site Remediation and Restoration
U.S. EPA, New England

Date:

9-10-03

Five-Year Review Summary Form

SITE IDENTIFICATION

Site name: Mottolo Pig Farm

EPA ID: NHD980503361

Region: 1 | **State:** New Hampshire | **City/County:** Raymond/Rockingham

SITE STATUS

NPL status: ✔ Final ☐ Deleted ☐ Other (specify)

Remediation status (choose all that apply): ☐ Under Construction ☐ Operating ✔ Complete

Multiple OUs?* ☐ YES ✔ NO | **Construction completion date:** 9/30/93

Has site been put into reuse? ☐ YES ✔ NO

REVIEW STATUS

Lead agency: ✔ EPA ☐ State ☐ Tribe ☐ Other Federal Agency

Author name: Roger Duwart

Author title: Remedial Project Manager | **Author affiliation:** U.S. EPA

Review period: 6/6/03 to 9/10/03

Date(s) of site inspection: 6/6/03

Type of review:

✔ Post-SARA ☐ Pre-SARA ☐ NPL-Removal only
☐ Non-NPL Remedial Action Site ☐ NPL State/Tribe-lead
☐ Regional Discretion

Review number: ☐ 1 (first) ✔ 2 (second) ☐ 3 (third) ☐ Other (specify)

Triggering action:

☐ Actual RA Onsite Construction at OU #____ ☐ Actual RA Start at OU#____
☐ Construction Completion ✔ Previous Five-Year Review Report
☐ Other (specify)

Triggering action date *(from WasteLAN)*: 9/11/98

Due date *(five years after triggering action date)*: 9/11/03

* ["OU" refers to operable unit.]

Five-Year Review Summary Form, cont'd.

Issues:

The potential exists for development to the south of the site to cause contamination to migrate towards residential wells.

The Mottolo property has the potential for residential development to occur before ground water cleanup levels have been achieved

Recommendations and Follow-up Actions:

NHDES will continue to sample residential and monitoring wells. If the results of sampling indicate that additional remedial actions are needed, options will be evaluated and implemented which would protect the public health.

Restrictions would need to be placed on the Mottolo property if development is allowed to occur before ground water clean up levels are achieved so that only areas capable of providing safe drinking water could be developed.

Protectiveness Statement:

Because the remedial actions being implemented throughout the Mottolo Pig Farm Superfund Site are protective, the site is protective of human health and the environment.

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Mottolo Pig Farm Superfund Site
Second Five-Year Review Report

I. Introduction

The purpose of a five-year review is to determine whether a remedy at a Superfund site is protective of human health and the environment. The methods, findings and conclusions of reviews is documented in five-year review reports. In addition, five-year review reports identify issues found during the review, if any, and recommendations to address them.

The U.S. Environmental Protection Agency (EPA) New England must implement five-year reviews consistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA Section 121(c) states:

> *If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented.*

EPA interpreted this requirement further in the NCP; 40 CFR §300.430(f)(4)(ii) states:

> *If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after initiation of the selected remedial action.*

EPA conducted this second five-year review of the remedial actions implemented at the Mottolo Pig Farm Superfund Site in Raymond, New Hampshire. This is a policy review since upon completion of the remedial action no hazardous substances will remain above levels that allow for unlimited use and unrestricted exposure, but five or more years are required to reach that point. The review was conducted from June to September, 2003. This report documents the results of the review. The trigger for this review is the signature date of the initial five-year review, September 11, 1998.

II. Site Chronology

Table 1 lists the chronology of events for the Mottolo Pig Farm Superfund Site.

Table 1: Chronology of Site Events

Date	Event
1975 - 1979	Disposal of wastes
1979	Discovery of the problem
1980-1981	Excavation, staging and removal of soil and drums
July 22, 1987	Final listing on NPL
March 29, 1991	RI/FS complete
March 29, 1991	ROD signature
June 24, 1993	Construction start
September 30, 1993	Construction completion
December, 1996	Removal of soil vapor extraction system
Spring, 1997	Removal of liner and regrading of site
September 11, 1998	First five-year review report
Summer, 2000	Removal of chain link fence, vandal-proofing of monitoring wells and de-commissioning of unused wells
Fall, 2001	Removal of interceptor trench

III. Background

A. Physical Characteristics

The site is located on Blueberry Hill Road in Raymond, New Hampshire. The Mottolo property includes approximately fifty acres of primarily undeveloped wooded land, roughly divided in half by a small brook with associated wetlands. About two acres of the property remain cleared from a former piggery which operated onsite. Two concrete pads for the former piggery buildings are still in existence. See Figure 1.

B. Land and Resource Use

The area around the site is wooded to the west with low density, residential development to the north, east, and south of the site. The newest development has occurred to the south. The closest residence is approximately 300 feet south of the site.

No public water is available. All homes near the site are served by private bedrock wells of varying depths.

C. History of Contamination

From 1975 through 1979, approximately 1600 fifty-five gallon drums and five gallon pails containing liquid and solid waste materials were disposed of on the hillside north of the piggery building located on the property. Drummed wastes were hauled to the site and pushed over the slope and covered with soil. Some drums ruptured. In addition, at least one tanker of liquid wastes was emptied in the same area. Evidence of leaking drums was reported to state officials in 1979. From 1980 through 1981, the EPA performed a removal action involving the excavation, staging, testing, on-site storage and off-site disposal of approximately 1,600 containers of wastes and some contaminated soil (see Figure 2).

D. Basis for Taking Action

Preliminary investigations conducted by the New Hampshire Water Supply and Pollution Control Commission (WSPCC) indicated that the disposal area was contaminating soils, surface water, and ground water with volatile organic compounds (VOCs). Among the VOCs found were methylene chloride, 1,1,1-trichloroethane, trichloroethylene, and tetrachloroethylene. Aromatics, including ethyl benzene and xylenes were also identified, as well as acetone.

IV. Remedial Actions

A. Remedy Selection

The remedial action objectives identified in the Record of Decision (ROD) issued March 29, 1991, are:

- ☞ To eliminate or minimize the threat posed to the public health, welfare, and environment by the current extent of contamination of ground water and soils;

- ☞ To eliminate or minimize the migration of contaminants from the soils into the ground water; and

- To meet federal and state Applicable or Relevant and Appropriate Requirements (ARARs).

The ROD identified soil vapor extraction (SVE) for remediation of the site soils, natural attenuation for remediation of site ground water, and institutional controls to prevent consumption of contaminated ground water until ground water cleanup levels were attained.

B. Remedy Implementation

The site was divided into two areas; the Former Drum Disposal Area (FDA) and the Southern Boundary Area (SBA).

EPA contracted with Metcalf & Eddy to develop the remedial design and implement the remedial action for soils. Work was divided into two phases: the first phase, completed in 1992, included design and installation of a site security fence and a ground water interceptor trench and distribution lateral around the FDA to lower the ground water level so that SVE could be effective down to the bedrock surface. The second phase included pilot testing, design, installation, and operation of the SVE system in both the FDA and SBA. A Preliminary Close-Out Report was signed on September 30, 1993, signifying construction of the remedy was complete and that the SVE was operational and functional.

In the fall of 1996, after three years of operation of the SVE, soil samples were taken and analyzed for VOCs. No contamination was found above soil cleanup levels in any of the samples. As a result, the extraction system was turned off, and all above-ground components of the system were removed from the site in December of 1996. The interceptor trench was removed from the FDA in the spring of 1997 and the area was regraded and seeded with grass (see Figure 3).

C. System Operations/Operation and Maintenance (O&M)

Currently, the remedy is monitored natural attenuation and the ground water is sampled once a year in the late spring. Ground water monitoring data indicates that the cleanup of the ground water is progressing somewhat slower than anticipated. The ROD cleanup goals for ground water, developed in response to the first remedial action objective, along with the maximum levels of contaminants found in monitoring wells since the last five-year review are presented in Table 2, below. See Figure 1 for the location of the monitoring wells.

Table 2: ROD Ground Water Cleanup Goals and Results

Contaminant	Target Level (µg/l)	1998-2002 Maximum/ Well No.	2003 Maximum/ Well No.
Arsenic	50[1]	600 µg/l/MO-3SR	782 µg/l/MO-3SR
Tetrahydrofuran	700[2]	560 µg/l/OW-2DR	192 µg/l/OW-2DR
1,1,1-Trichloroethane	200	2 µg/l/MO-3SR	ND
Trichloroethylene	5	280 µg/l/OW-2DR	109 µg/l/OW-2DR
Ethylbenzene	700	6 µg/l/MO-3DR	ND
Toluene	1000	ND	ND
cis-1,2-dichloroethene	70[3]	660 µg/l/OW-2DR	358 µg/l/OW-2DR
trans-1,2-dichloroethene	100[3]	94 µg/l/MO-3DR	42 µg/l/MO-3DR
1,1-Dichloroethane	81	140 µg/l/OW-2DR	120 µg/l/OW-2DR
Vinyl Chloride	2	67 µg/l/MO-3DR	37 µg/l/OW-2DR

[1] New drinking water standard for arsenic is 10 µg/l.
[2] New Ambient Ground Water Quality Standard, established by NHDES, for tetrahydrofuran is 154 µg/l.
[3] The ROD target level was set at 70 µg/l for total dichloroethene

Maintenance primarily involves ensuring the integrity of the monitoring network so that representative samples can be obtained. NHDES personnel had indicated problems with some wells (primarily drainage issues) and corrective actions were taken as needed.

V. Progress Since the Last Five-Year Review

The last five-year review contained three recommendations for ensuring the protectiveness of the remedy. The status of their implementation is presented below:

The periodic (currently twice a year) ground water sampling done by NHDES should continue in order to monitor the progress of natural attenuation of the contamination which emanated from the FDA and to ensure that the SBA ground water contamination remains below cleanup levels.

The ground water sampling is now being done once a year by NHDES since no significant seasonal differences were seen between the twice yearly events. Sampling is showing a gradually diminishing area of ground water contamination downgradient from the FDA. One bedrock well (MW-21D) and one overburden well (MW-8S) in the SBA are above the cleanup level for only trichloroethylene. Preliminary data prior to the first five-year review had indicated that cleanup levels had been reached in the SBA. Subsequently this was shown not to be true.

The potential for residential development should continue to be monitored to ensure that institutional controls are instituted if needed.

Residential development has been proceeding rapidly along the southern and northern borders of the site. The United States Geological Survey (USGS) has investigated the potential for the newly installed residential wells to draw contamination from the SBA into them. Wells closest to the site (and to MW-21D) were sampled before residents moved in and no contamination from the site was found. At this time, there does not appear to be any adverse affects from the residential pumping. Therefore, there is no need to put institutional controls on those properties. NHDES will continue periodic ground water monitoring of residential wells and site monitoring wells in order to determine if there is a need to address the contamination in some way. EPA has control over development on the Mottolo property under authority of CERCLA and by virtue of having a lien on the deed. NHDES also has a lien on the property. Therefore, additional institutional controls are not warranted at this time.

Continued vigilance should continue to ensure that vandalism does not result in compromising the integrity of the sampling data.

As a result of vandalism which continued after the last five-year review, EPA contracted to have wells vandal-proofed, and decommissioned where no longer needed. A new outer gate was installed at the site and the inner fence was removed. No vandalism has occurred since these activities were completed, however, some evidence of trespassing with an all terrain vehicle was noticed during the site inspection.

VI. Five-Year Review Process

A. Administrative Components

The Mottolo Superfund Site five-year review was conducted by Roger Duwart, the EPA Remedial Project Manager, with assistance from Sharon Perkins, the NHDES Remedial Project Manager.

B. Community Involvement

Copies of the review are being placed in the information repositories, including the Dudley-Tucker Public Library in Raymond, New Hampshire. A copy is being provided to the Town Manager.

C. Document Review

This five-year review consisted of a review of relevant documents including ARARs and monitoring data provided by NHDES. The sampling documents reviewed are presented in Attachment A.

D. Data Review

Review of records and monitoring reports through June of 2003, indicates that the remedy is performing as designed, but cleanup is occurring slower than predicted.

For the site, ten ground water Chemicals of Concern were identified and had cleanup levels set. In the latest ground water sampling round (June, 2003), twenty-two compliance wells were sampled. Six chemicals of concern did not meet their specified cleanup levels, however most of the exceedances were in two bedrock wells (MO-3DR and OW-2DR) located east of the FDA. The results of latest sampling round are presented in Table 3, within Attachment C.

E. Site Inspection

Representatives of EPA and NHDES, participated in the site inspection held on June 6, 2003. During the inspection, the residential development taking place along the southern and eastern borders of the site and the ground water monitoring wells were observed.

F. Interviews

Conversations have taken place with two developers of the property abutting the site and with the Town Manager. All have expressed concern that the residential wells can be shown to be safe for use. Each seems satisfied with the monitoring which has been done to document that safe drinking water is available and with the future residential well and monitoring well program to be conducted by NHDES.

VII. Technical Assessment

A. Is the remedy functioning as intended by the decision documents?

The ROD estimated that after the source area soils were remediated by SVE, the overburden ground water would achieve cleanup levels within six years and the bedrock ground water would achieve cleanup levels within three years. While this has not occurred, both the level of contamination and the extent of the ground water contamination have diminished.

B. Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of remedy selection still valid?

There have been significant changes in land use near the site which could change the exposure assumptions contained in the ROD. Residential development has occurred on property adjacent to the site and on one parcel with ground water contamination beneath a portion of it. Ground water monitoring done to date indicates that contamination from the site may be affecting one residential well since levels of TCE and cis-1,2-DCE were found, but were below drinking water standards. As additional homes are built and water consumption increases, it will be important to continue to monitor the area for indications of migration of contamination towards the south.

The following applicable or relevant and appropriate requirements (ARARs) were reviewed for changes that could affect protectiveness:

Safe Drinking Water Act (40 CFR Part 141)
Resource Conservation and Recovery Act (40 CFR 264)
Clean Water Act (40 CFR 122)
New Hampshire Code of Administrative Rules Env-Wm 1403 (formerly Env-Ws 410)

The bases for three of the ground water cleanup levels have changed. The ROD set the cleanup level for tetrahydrofuran (THF) at 700 µg/l, which was a New Hampshire consumption advisory for water supplies. This level has since been lowered to 154 µg/l and promulgated as an Ambient Groundwater Quality Standard in Env-Wm 1403. Since, as indicated in the most recent sampling, all monitoring wells contain less than 154 µg/l of THF, the remedy remains protective and is in compliance with this ARAR.

The second compound for which the basis of the cleanup level has changed is total 1,2-dichloroethene (DCE). Since separate analyses for cis and trans isomers of 1,2-DCE were not being performed at the time of the ROD, the cleanup level was set at the more restrictive drinking water standard for cis-1,2-DCE, 70 µg/l. The two components of 1,2-

DCE are now analyzed for separately; cis-1,2-DCE has a drinking water standard of 70 µg/l, and trans-1,2-DCE has a drinking water standard of 100 µg/l. Levels of both of these compounds have been dropping at the site but cis-1,2-DCE still exceeds its drinking water standard in two bedrock wells located downgradient from the FDA. It is expected that natural attenuation will result in this compound meeting its drinking water standard. Thus, the remedy is protective and in compliance with these ARARs.

Finally, the drinking water standard for arsenic has been lowered from 50 µg/l to 10 µg/l. Since the highest levels of arsenic are generally associated with ground water having high concentrations of VOCs, it is expected that the arsenic cleanup level will be achieved at approximately the same time as the cleanup levels for the VOCs are achieved. Thus, the remedy is protective and in compliance with this ARAR.

No other ARARs or "To Be Considered" criteria were changed which would affect the protectiveness of the remedy.

C. Has any other information come to light that could call into question the protectiveness of the remedy?

No other information has come to light which would call into question the protectiveness of the remedy.

Technical Assessment Summary

The following conclusions support the determination that the remedy at the Mottolo Superfund Site remains protective of human health and the environment.

☛ Land use changes have occurred adjacent to the site, with residential development proceeding. However, monitoring designed to assess the potential for ingestion of contaminated ground water has shown that residential wells are not affecting contaminant migration and therefore the remedy remains protective.

☛ No new contaminants, sources or exposure pathways were identified during this five-year review.

☛ The ground water flow patterns are consistent with the expectations at the time of the decision documents.

☛ A ground water monitoring plan is in place, sufficient to identify potential future problems and to provide information to address them, if necessary.

☛ The remedy is performing as expected, albeit slower than originally projected, and there are no indications of a potential failure.

☛ This five-year review identified three more stringent health-based standards, however the remedy, given additional time, should achieve them.

VIII. Issues

Water use resulting from residential development occurring adjacent to the site needs to be carefully monitored to ensure that ground water flow patterns are not altered such that the remedy is no longer protective. Since only one bedrock monitoring well (MW-21D), located just south of the southern Mottolo property boundary, has contamination above cleanup levels and since this contamination has been generally declining, it is not likely that this contamination will adversely affect the quality of the water in nearby residential wells. The sampling program for residential and monitoring wells is designed to identify any problems and provide necessary information to enable decisions to be made to address them before public health is adversely affected.

Inquiries have been received concerning the development of the Mottolo property. While portions of the property could support residential wells, much of the property should be restricted to ensure that contaminated ground water is not used for human consumption.

Issue	Currently Affects Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
Potential exists for development to the south to cause contamination to migrate towards residential wells	N	Y
Mottolo property has potential for residential development before ground water cleanup levels have been achieved	N	Y

IX. Recommendations and Follow-up Actions

NHDES will continue to sample residential and monitoring wells. If the results of sampling indicate that additional remedial actions are needed, options will be evaluated and implemented which would protect the public health. One such option could be the installation of point-of-use water filters in any affected homes.

If the Mottolo property were to be developed in the near future, portions will not be suitable for the use of residential wells until ground water clean up levels are achieved.

Therefore, restrictions would need to be placed on the property to ensure that only areas capable of providing safe drinking water could be developed until ground water cleanup levels are achieved.

Recommendations/ Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Follow-up Actions: Affects Protectiveness (Y/N)	
				Current	Future
Monitor ground water quarterly for residential wells near MW-21D for one year, and annually thereafter for residential and monitoring wells included in the sampling program	NHDES	EPA	September 2003 to begin quarterly sampling of residential wells Late spring 2004 for monitoring wells	N	Y
Monitor water levels in MW-21D at least until late September 2003	USGS	EPA/NHDES	September 2003	N	Y
Impose institutional controls on Mottolo property, as needed, if developed or sold/subdivided	EPA/NHDES	EPA/NHDES	Prior to development or sale/subdivision	N	Y

X. Protectiveness Statement

Because the remedial actions being implemented throughout the Mottolo Pig Farm Superfund Site are protective, the site is protective of human health and the environment.

XI. Next Review

This site requires policy reviews every five years since upon completion of the remedial action no hazardous substances will remain above levels that allow for unlimited use and unrestricted exposure, but five or more years are required to reach that point. The next review will be issued either on or prior to five years from the date of signature of this report.

ATTACHMENT A

DOCUMENTS REVIEWED

"Results of September 1998 Sampling Round at Mottolo Pig Farm, Raymond, NH," New Hampshire Department of Environmental Services, November 10, 1998.

"Results of Spring 1999 Sampling Round at Mottolo Pig Farm, Raymond, NH," New Hampshire Department of Environmental Services, July 22, 1999.

"Results of Spring 2000 Sampling Round at Mottolo Pig Farm, Raymond, NH," New Hampshire Department of Environmental Services, May 22, 2000.

"Results of Spring 2001 Sampling Round at Mottolo Pig Farm, Raymond, NH," New Hampshire Department of Environmental Services, July 9, 2001.

"Results of Spring 2002 Sampling Round at Mottolo Pig Farm, Raymond, NH," New Hampshire Department of Environmental Services, July 26, 2002.

"Results of Spring 2003 Sampling Round at Mottolo Pig Farm, Raymond, NH," New Hampshire Department of Environmental Services, August 11, 2003.

ATTACHMENT B

FIGURES

Figure 1 Mottolo Pig Farm Site Map with Sampling Locations

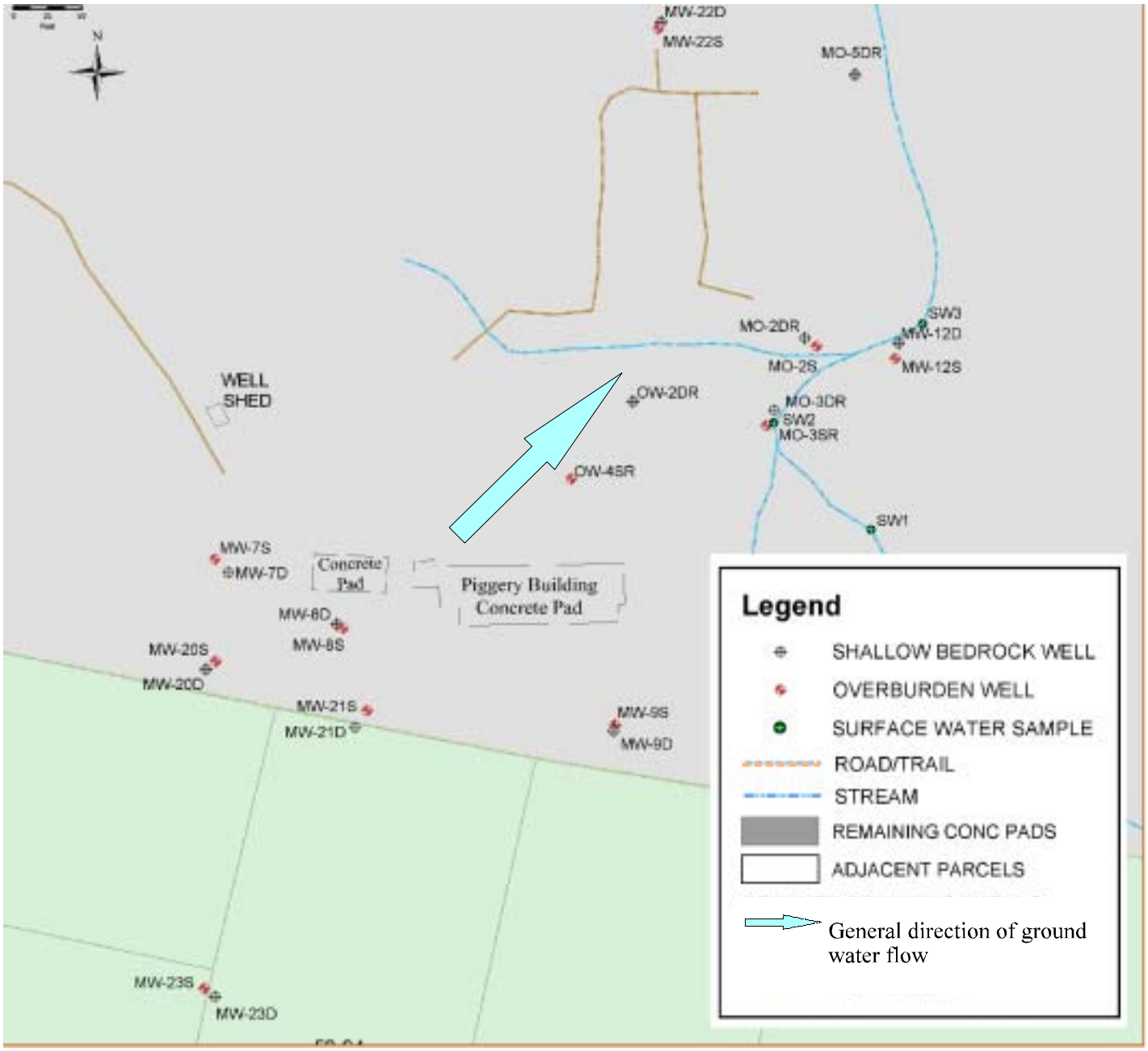

Figure 2 Removing drums 1980 - 1981

Figure 3 Regrading site 1997

ATTACHMENT C

TABLE 3

TABLE 3

Summary of June 2003 Ground Water Sampling

Concentrations in ug/l

Compound	MO-2S	MO-2DR	MO-3SR	MO-3DR	OW-2DR	OW-4SR	MO-5DR	MW-7S	MW-7D	MW-8S	MW-8D
1,1-Dichloroethane	60	33	36	16	**120**	5.1	3.1	---	---	---	---
Cis-1,2-Dichloroethene	14	11	20	**208**	**358**	---	6.6	---	---	---	---
Trans-1,2-Dichloroethene	---	---	3.3	42	7.2	---	---	---	---	---	---
Tetrahydrofuran (THF)	50	60	24	109	**192**	---	26	---	---	---	---
Trichloroethene	**8.6**	3.6	**12**	**89**	**109**	---	---	---	---	**57**	---
Vinyl Chloride	**5**	**2.7**	**10**	**44**	**37**	---	---	---	---	---	---
1,1,1-Trichloroethane	---	---	---	---	---	---	---	---	---	---	---
Ethylbenzene	---	---	---	---	---	---	---	---	---	---	---
Toluene	---	---	---	---	---	---	---	---	---	---	---
Arsenic	**347.3**	4.5	**782.0**	**73.5**	**255.6**	<1	n/a	n/a	n/a	n/a	n/a

Compound	MW-9D	MW-12S	MW-12D	MW-20S	MW-20D	MW-21S	MW-21D	MW-22S	MW-22D	MW-23S	MW-23D
1,1-Dichloroethane	---	---	---	---	---	---	---	---	3.2	---	---
Cis-1,2-Dichloroethene	---	---	9.9	---	---	---	---	---	11	---	---
Trans-1,2-Dichloroethene	---	---	---	---	---	---	---	---	---	---	---
Tetrahydrofuran (THF)	---	---	---	---	---	---	---	---	---	---	---
Trichloroethene	---	---	4.4	---	---	---	**34**	---	4.1	---	---
Vinyl Chloride	---	---	---	---	---	---	---	---	---	---	---
1,1,1-Trichloroethane	---	---	---	---	---	---	---	---	---	---	---
Ethylbenzene	---	---	---	---	---	---	---	---	---	---	---
Toluene	---	---	---	---	---	---	---	---	---	---	---
Arsenic	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

--- Below Detection Limit
n/a compound not analyzed for
Concentrations in "bold" exceed clean up levels